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| **Subject:** Mathematics | **Teacher:** Vicki Lyttle |
| **Grade Level:** 7 | **Date: 08/30/2010** |
| **Topic:** 43. Surface Area of a Rectangular Prism | **Time (min):** 60 mins |

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| **Learning Goals** |
| **By the end of this lesson, my goal is that students will be able to:**   1. use investigative methods to break down a rectangular prism into its simplest shapes 2. tell someone what surface area is (and/or what it is not) 3. measure the surface area of a rectangular prism |
| 1. **Ministry Expectations** |
| **Strand**: Measurement  **Specific Expectation(s): Page 102:** “determine, through investigation using a variety of tools (e.g.,   nets, concrete materials, dynamic geometry software, Polydrons),   the surface area of right prisms;”   (<http://www.edu.gov.on.ca/eng/curriculum/elementary/math18curr.pdf>) |
| 1. **Pre-Assessment** |
| **Before this lesson, students show know/understand:**   1. how to measure the areas of rectangles and squares (special case rectangles) 2. what a rectangular prism is 3. how many sides a rectangular prism has 4. how to use a ruler to measure area |
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| 1. **Required Resources** |
| **Each student will need:**   * **Pencil** * **Ruler** * **Rectangular prism net**   **Each pair of students will need:**   * **A rectangular prism block** * List **ALL** the resources you plan to use in your lesson (e.g. print resources, web resources, audio visual resource, handouts, manipulatives, books, videos, posters). * **Staple any handouts to the back of the lesson plan** * Make sure you write down enough information about your resources so that anyone could replicate the lesson at another time   **Example:**  Each student will need   * a pencil * a workbook * a bell work handout   Each pair of students will need:   * a set of fraction circles * a handout (see attached) * a piece of chart paper to share results with the class |
| 1. **The Main Lesson** |
| **a) Agenda**   * Outline in point form what will be covered that class * Usually 3-5 items   **Example:**  **Adding Fractions with Different Denominators**   * 1. Numerators and denominators?   2. Adding fractions with the same denominator   3. Adding fractions with different denominators (Pictures)   4. Gallery Walk   5. Sharing solutions   **b) Bell Work Questions**   * be handed to students as they come into class (or it could be written on the board) * often a question to get them focused and thinking about the work they did in the previous class or the work they are about to do      1. Show me what a denominator means with a picture (no words) 2. Show me what a numerator means with a picture (no words) 3. Show me in pictures how to add 1/4 of a pizza to 1/4 of a pizza |

**c) Introduction – Minds On Total Time: 10 min**

* List the total time in the top right corner of this box
* Try to justify/demonstrate why the topic of the day is relevant to grade 7 & 8 students
* Include your logical link to the previous lesson & a brief review
* Write step by step instructions about how to carry out your Minds On activity

**Example:**

***Justification***

**Get attention of class: 5-4-3-2-1 - All eyes on me**

Up until now we have added fractions with the same denominator - we talked about why we might do this - For example, in a recipe for cooking - when a carpenter might need to add fractions while building a cabinet - when you might want to add up your marks on a test - when you got half marks or in a video game when the designer has to make a character like Mario move - if you want to design video games, you need to be able to add fractions.

In short, the world doesn't really work in whole numbers - we need fractions to measure stuff accurately. And we need to measure stuff accurately if we want to produce anything: buildings, sports equipment, video games, computers - we really need to be accurate.

So today, we are going to take this a little further - we are going to add fractions with different denominators. Simply because we need to be more accurate.

These are some examples

**1/2 + 1/4 or 1/8 + 1/4 or 1/3 + 1/6 (put on the board)**

***Present the following problem.***

I have a brother (John) and a sister (Jinny) - They are older than me. When I was a kid, my Mom made the best apple pie - Unfortunately, my bother and sister were smarter than me and they always seemed to get to the pie first. My brother was a pig and ate 1/2 the pie - my sister took 1/4 of the pie.

In pairs, I want you to draw a picture of the pie in this problem

a) identify how much pie my brother John the pig ate

b) identify how much pie my sister ate

c) what fraction presents how much they ate together

Ask 2 groups to do their work n the board.

**Tell students they have 5 minutes**

**Give them one minute left reminder**

**Sharing Solutions**

**Get attention of class: 5-4-3-2-1 - All eyes on me**

* review solutions of students on the board
* asks students to explain their thinking
* ask for other ways students might have solved this problem

**Summary**

* Show students that they have just added 1/2 + 1/4 (which are different denominators)

**c) Teaching Plan - Action Total Time: 40**

* This section should consist of a series of activities
* List the total time for each activity as well (if there is more than one activity)
* Please list enough detail so that any teach could do the activity

**Example:**

***Activity 1 - Fractions and Desert (25 minutes)*Get attention of class: 5-4-3-2-1 - All eyes on me**

***Write this on the board (or have it on chart paper to save time)***

1. Have student identify who is A and who is B in their groups
2. Person A must come up and get a piece of chart paper and two colored markers
3. Person B picks a favourite dessert of his/hers
4. **Give each team a number and have them write it down on their chart paper with the student names**
5. Ask all students to write down their favourite dessert (1 min)
6. Now I want you to create an interesting problem like the one I presented involving the   
   favourite dessert (picked by B) - and at least two people eating different fraction of that dessert  
   a) One person eats one fractions (e.g., 1/3, 1/3, 1/4, 1/8)  
   b) Another person eats a different fraction (e.g., 1/3, 1/3, 1/4, 1/8)  
   c) How much did they eat altogether
7. Try to create interesting, funny stories.
8. Write a title AND question down on the chart paper (pick person with neatest writing)
9. Write a solution down on a piece of paper
10. You have 20 min

**Circulate fast to make sure students are on tasks**

**Give student time reminders after each 5 minutes**

**Give them one minute left reminder**

**Get attention of class: 5-4-3-2-1 - All eyes on me**

1. Person B must come up and get two piece of tape
2. Tape your problem up on the wall
3. Have a gallery walk - to look at the problems (class walks around in a line looking at and reading the problems (5 min)

***Activity 2 - Fractions and Desert (15 minutes)*Get attention of class: 5-4-3-2-1 - All eyes on me**

1. Pick a problem that one group has done.
2. Solve it as a team
3. Have 2 groups solve problem at the board
4. Take up problem
5. Repeat steps 1 to 5 for another problem.

**d) Consolidation & Assessment Total Time: 10**

**Get attention of the class:** “If you can hear my voice, clap once…”

**Summary:**

So, today we investigated the surface area of rectangular prisms:

1. Can anyone tell me what surface area is?
   * + Take answers from the class
2. Can anyone tell me how many surfaces a rectangular prism has?
   * + Take answers from the class

Give students a “Ticket Out of Class” handout with the following questions:

1. How many sides of a rectangular prism have the same area?
2. What shapes are rectangular prisms made up of?
3. What is the surface area of a 2 cm x 3 cm x 4 cm rectangular prism?
   * + Provide a “to scale” net

**Did you like today's lesson? Why or why not?**

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| 1. **Optional Home Activity** |
| * There is considerable evidence to suggest that homework is not correlated with improvement in understanding * In fact, homework is correlated with decreased interest in learning * So make homework interesting, don't give it all the time, and make it optional   **Example**  Challenge Problem Say "These are two tough problem - real challenge questions - I shouldn't even be giving them to you, but you did so well today - Let's see if anyone can find a solution to.  Not everyone should try this - I don't want you to hurt yourselves. In fact, I doubt anyone could really solve it BUT what the heck. (ham it up a bit - use a little humour)  1/2 + 1 /10  1/2 + 1/3 |